Notebook, N-99-06-06

This notebook covers the period June-August 1899. It was used by Edison and an unidentified experimenter for notes and drawings relating to batteries, probably Edison-Lalande primary batteries. The first part of the book [not selected] contains routine logs of cell tests and is a continuation of N-99-02-28 [not selected]. On the inside front cover and resuming in the middle of the book are notes, primarily by Edison, regarding variations in battery electrolyte and electrodes. The spine is labeled "146." The book contains 2 numbered pages, followed by approximately 140 unnumbered pages. At least one page has been removed from the book.

Only the material by Edison has been selected.

N-99-06-06 (RE: 1.72)

Hydrochinon
+
phosphorolled Hydrogen
+
Alloxantin

are the only ones that
Directly precipe Copper -

perhaps Alloxan does but
it may not it acts very
slow & discolors from time
to time & may throw a
precipitate =
The others color solution
so Cant tell if there is
a precip =

Batteries — 1.

June 6, 99 -

Cell #1 -
Lead & Zn -
Precip. from Ferro Cy Potass & Sulph Zn -
Probable excess of sulph -
Charge & Dis at 1/8 Amp —
No of Charges 144
Notice smell like Cl =

Cell #2 -
2 Zn - filled with Zn powder
from old cell. pressed in wet —
5% sol - cy. potass —
Current from Chrom 1/8 Amp —
Very little action —
Zn falls out slowly

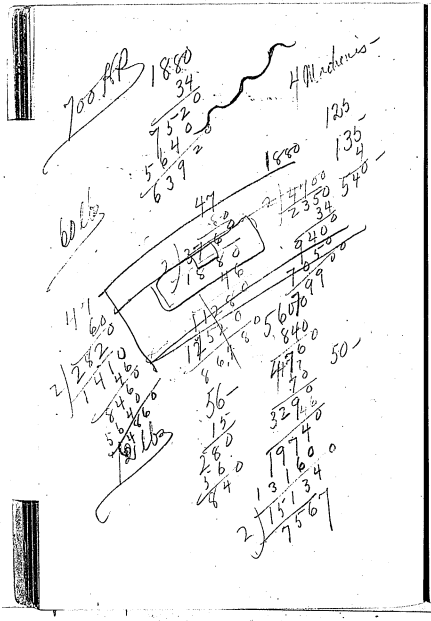
3d – ~~Sodium~~ Acetate Potas –

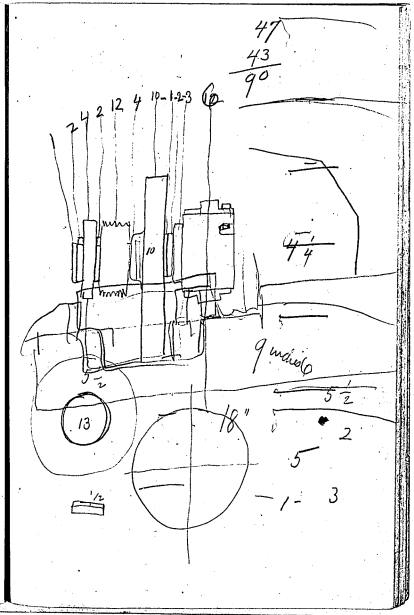
4d Potas Nitrate

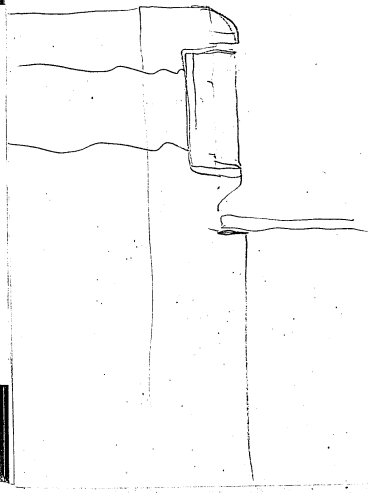
Change .07 Amp –
3a, 1d, 3d, & 4d blue –
5 min dis on each –

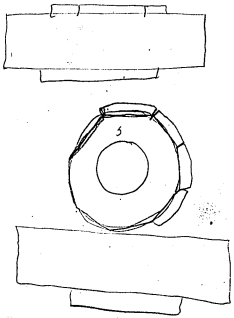
4a – .30 – .35 2a – .20 – .20 1d – .40 – .27 2d – .32 .33
3d – .25 – .33 4d – .28 – .28

All in series 4d weakest – 3a – 2d – 3d
after 3a nearly equal
all three last bad


700 ft
4 M. adhesive
60 lb
11'1
8 lb


47
43
90
2 4 2 12 4 10-1-2-3 6
10
9 inches
13
18"
2
5
1-3




5

Hydroxylamin attacks Copper grid
much & also CuO that drops
down & gives off gas,
Formaldehyde does the same
both charge & discharge with
unamalgamated ~~Zinc~~ Nickel
plated Electrode perfectly
in KOH -

In KOH Sol -
Resorcin plates good
& discharges good -
Solution only faintly colored
greenish — with Hydrochinon
same solution, plates
& discharge good - Solution
opaque red, pbly absorb
O from air +

Standard 3 cells KOH

1st Resorcin which had been used once — plate was dipped tinned now plate amalgamated, Run 1.15 — ampere hours — deposit fair but too much fluff at edges near bottom, think 75 amph would be ~~be~~ good — Liquid greened but not to opacity — This solution is apparently not affected by atmosphere

O —

2nd Cell – Common aldehyde
NitHgd plate deposit fluffy
ng

3rd Cell, Eikonogen
NitHg plate – div – fluffy at
Edges not so good as
Resorcin –

Put them all dischg
9.40 AM –

Turned Elec Hgd
in Resorcin good
only one good ~~of~~
aldehyd & Eikonogen ng

test of 5 cells

KOH - para amidophenol

Colors solution Red —

#. ▭ this much in —

Phenacolin — KOH

Colors liquid Red —

▭ this much in

Aluminum Tannate KOH

Colors Sol light red —

hot precipitate deepest red

▭ this much

55

10.5 9

KOH Alloxantin –
Colors solution bright pink –
Thus much

Manganese Sulphate
Solution colorless = There is a
precipitate – Thus much

All above put in
1105 pm –
16½

Electrodes are not good
Q think –

after running 9 hours -
Aloxantin Solution clear
deposit fair but black fluff
on front & on back ~~black~~ only
at bottom - I think poor
amalgamation is cause

Tartrate Manganese
Clear Solution somewhat
browned by floating oxide
MnO_2. Zinc good except
on Edges where there was
light fluff Extending outwards
from the sharp Edges $\frac{1}{4}''$
on shaking plate the whole

detached itself & the plate is fine. giving I think the best results yet -

---

Tannate aluminum
Color about same depth but yellowish - deposit fair black fluff over plate think its due to bad amalgam think Tin plate give good results.

Phenacolin - all covered black fluff no yet this discharged the longest

Paraamidophenol
add fruit black fluff - no

discharging —
Cathode in Tartrate Mang
turns blackish & there is a
slight gassing but nothing
to amount to anything
all the others gave little
also —

both Aloxantin + Tartrate Mn
should be tested again
Don't think there could enough
Aloxantin & perhaps not
Enough Tartrate Manganese
also should have turned
Excludes —

Iantrole Mn Exhausted 1st
9.54 - plate clean but
dirty -

Paraaminophenol
2nd to Exhausted 10.12 -
plate bright.

~~Sodium Immate~~
3rd

Aloxantin 3rd
plate clean but + bright perfect reduc
by Reversal & plated
blocken - 10.17

Alumm Tannate
plate perfectly bright
Elegant, .1018

Rhenadalin - bright
plate - good - 10.35

Recharged a little for
about 1 amp hour
Tartrate Mang
Aloxantin - } good
bright satisfactory deposit

Renacolon —
Alumn Tunnati —
Amidopheral —
only little black
fluff + much better
than on 1st charge
There may be a tinge
of blue in allokarthi
from not having enough
allorah in op
2nd charge
2nd discharged Comment
5.10 pm —

all dischgd when I came
at 710 — all plates
clean —
Paramidophenol Hg gone
Phenacetin " "
Alumn Tannate Hg all on bright
Aloxantin "
Tartrate Mang Hg apparently gone

3rd Charge .23
710
at 930 found it at .2
all Cathodes good but
Tartrate Mang thro
black fluffy ppty want of Mn

Aloxantin Especially bright

Aluminum Tannate best deposit,

Phenacolin is next best & may be as good as Tannate —

Tantalic Mang was played out had to discontinue

Trouble think oxide covered Cathode & made high Res — put it down to

at 11 pm = .1 amp

at 745 next morning .07

62.
85.
74
1.

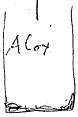
with the .62 of amphour on
previously thro makes.
1.47 amphour

I now discharge them all thro
Res - giving .53 on amperes
Started. 7.50 Am

Aloxantin was the best deposit
& Salutin has always kept
beautifully clear -

Tannate Alumina is next best
Phenacetalin next
& Paraamids the next.
the latters ~~[illegible]~~ deposit
is good - nearly all from
but is too much for it

Whereas Aloxanthi is nearly perfect except at bottom where there has been great density due to Hg being there at start



- blackish but non deadhable bottom, plate fine grain hard + smooth, bright

all rest plate fine

Grids are clean & nickel colors on Alloxantin + Tannate, not so good on amnedo & rather dark on Phenacetolin —

after 2 H, 5, mm at .3 —
Alloxantin cell discharged 9.55 — took cell off —

deflection now .37 —
~~10.15~~ 11.15 Tannate aluminum
~~D~~ discharged —

Phenacetolin — 11.06 plunged

Tannate plate is black & brightest — all are bright except at bottom

but Tumish is bright all over
In previous tests I though
Hg was gone from some of
the plates, its not correct
Hg is on all - a little dust
obscured the shine - This
time there is no dust —

I now recharge Amido-
Phenacetolin, Formal, Al &
Alloxantin, in the Alloxantin
Cell & put some Alloxan
which colored the solution
& without Current it went
Colorless due ~~to~~ by to
reduction to alloxantin by the plug Zinc
at bottom Cell - as

noticed it stopped giving off Hydrogen —

I have added 5 new cells changing at same time —
These cells have KOH —
Turned from Eichhorn not amalgamated, - going toward left. next to Tannate Al —
is cell with considerable of Solution Alloxan —
The next is 10 cc of strong Sol Tannate Al (KOH in Sol)
next 5 cc next 3 cc next 2 cc next + last 1 cc —

~~Started~~ 1145 .02
1150 still .2
off at noon one hour

Inactive that Alloxan cell
has gone colorless +

off at 4 10 — giving .60
amp hour

Amuds - fluffy mass - bad

Phenacetin - fair little
tendency to fluff mass —

Ammonium Al - perfect.

Alloxantin after charge
bad mass - block fluffy
all over

new Alloxan Tin not top Electrol
fair fluffy at back at Top
& inside dills –

1st 10 cc Jannah Al – fine but
black warts at back near
top at least density
inside perfect –

2nd Jannah 5 cc
inside perfect, back nearly
all top insolubles black
warts.

3rd 2 cc – Whole of back

has isolated warts front
or inside only a few at top
4th Jannate only few inside
out at Top -

discharge (Commercial)
4.15 .68 AMP

found them all discho
when I returned at 5-40

Armds black -
Pharaoh Little black at
bottom but fair -
Jannate A1 - Bright perfect

Aloxantin black at bottom but
fan
~~with~~ Alloxan black
all the Tu Jannals
very black I wiped them
with finger & started
charging at 5.42 —
.2 amp —
stopped 5 minutes at 6
making start 5.47.
.8 of amp hour on
I watch condition of Cathode
before desiding —
Amedo — good all over
Phenoacetin — good with
now & then a black fluff

Ppot very small & $\frac{1}{4}$ in apart

Tannate Alum

back good

inside

otherwise good —

as this is 1st time it has shown any flufs think Tannin exhausted & Cu[illegible] reached out at top & made flufs spots —

old Alloxantin good
Alloxan - fine -

10 cc Tannate fine
but inside Zinc has
reached outward but they
are blue + hard

its good

5 cc Tannate
good - Edges have progressed
but they are blue - good

2 cc Tannate has projection
but not so great as 5 cc
in fact projections decrease
up to 1 cc they are on 1 cc
very small — No flufs
on any of the new
Tannates — Know
discharge
with the above cells
I had put in a Corrugated
Tinned Iron Cell with
5 cc Tannate alumin
plates good except a
sponge of good blue Zinc
See several pages
ahead

Success

20% KOH 5% gran KCy ZnO —
deposit .017" thick at bottom
.010 middle —
.008 at top —

25% ~~[illegible]~~ NH_2SO_4 ZnO —
a little good metal & some heavy sponge.

15% KOH 10% ACl ZnO —
good plate for 10 hrs but cons not repeat and appears to be exhausted.

Acetate K. Acetate Zn —
Good for 24 hrs — but no longer.

~~Borate Zn & Ammonia~~ —
10% Alum & ZnO — good plate but precip. forms —

10% Alum sat Zn Acetate, very hard & brilliant deposit. large bubbles on edges but hard good metal —

Failures

25% KOH 10% KCy ZnO
very little deposit gas

25% KOH not KCy ZnO -
very little deposit gas -

15% KOH. not KNO_3 (Ch. Ston 10%) ZnO -
Kathod not dissolved -

15% KOH 10% Potass Acetate ZnO -
spongy deposit

15% KOH Chromate potass ZnO
gas - no deposit -

25% KOH, K_2SO_4, ZnO. N.G.

KHO + $CdSO_4$ heavy precip -
did not ~~[illegible]~~ wire it -

15 KOH Potass Phos - ZnO -
rough.

15 KOH 9% KBr ZnO -

25% KOH 15% NH_4OH ZnO

☆ Failures —

25% KOH 2% sulph. Cy. Potass, ZnO —

25% KOH 2% Ferro Cy. K, ZnO
gave —

25% KOH 2% K Chromate ZnO
gave

25% KOH 2% NH_4Cl ZnO —

25% KOH 2% Oxalate Soda ZnO —

25% KOH 2% KCO_3 ZnO —

25% KOH 2% K, bicarbonate ZnO —

25% KOH 2% K_2S ZnO —
could not get good coal —

25 KOH + CaOH —
heavy precip.

Hardness

25% NaOH 5% KCy, ZnO —
Foam + Oxy — NS —

25% NH_4NO_3 ZnO —

25% KCy cert with ZnCy;
gas, no plating —

NH_4SO_4 ZnO very good.

20% phosphate Ammo + phos Zn.
Zn does not dissolve

Ammonia, Borate, ~~[illegible]~~
spongy deposit —

$NHCO_3$ ZnO — very high resist and an —
good, no deposit.

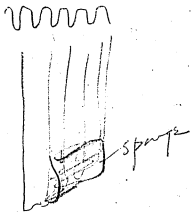
Alum, ZnO — CS_2 —

Acetate of K Acetate Zn —
good for 24 hrs and fail —
deposit spongy Zn taken up. O.K. —

add CS_2 failure

Harlings
Bretzlin + Ammonia
NaOH + $ZnSO_4$ Sol –

down at bottom



started discha at 950
.7 amp –
at 1020 – .65
at 1107 "

Phenacedrin discharges

Aloxantin old - discharged

I notice blue coming off

~~[illegible]~~ cathode which

is now reversed.

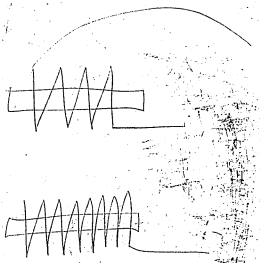
This shows that Cu has

been deposited along

with Zinc or the

blue is due to something

Else



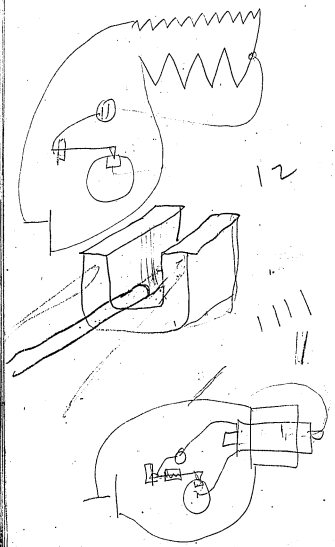
in the morning at 8.30

The old 4 - are apparently clean & show no Hg - all the others are black - Recharge without cleaning

Started all charging again at 8.30. .2 amp - after starting I notice old 4 cells all gassing on Cathode, & globules of Hg under it on tumbler

This shows that heavy Cells on short ckt all night oxidized the Cathode & all the Hg came off —

~~Hg~~



The Phenolphthalein kept giving as all Hg was off I put in at 9.15 a Tinned Iron Cathode Hg —

at 12.20 I found Current down to .05

It was due to bad Contact in 1cc Jennings cell — I shortcircuited it ~~[illegible]~~

Started charging all cells at 1231.

The Tinned Hg Electrode

m Amid came down bright
all the others dark - new set
black -

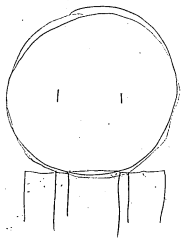
I now reamalgamated old 4 +
the Corrugated + amalgamated
the New 5 of Turned Elec
which are not Hyd -

.2 at 2 25 pm -

off 1 hour

6 pm - About 3 hours
average current
.18

I leave ckt open from
Saturday 6 pm till
Tuesday morning
young fishing



75
12
50
15
75
90

The ·58 of ampere deposit discharged till this morning Tuesday —

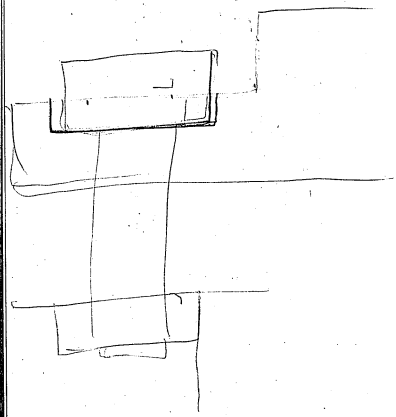
Corrugated plate had all taken away its charge —

The following went in order

minutes			
20	No 2. amidophenol.	10 30	old Ni
	5 Alloxantin	10 40	" Ni
	7 ~~10~~ 8 cc Jamaica al	10 41	new Tin
	10 1 cc "	10 42	" Tin
	4 Jamaica al	10 48	old Ni
	3 Phenacetalin	11 10	old Ni
	6 Alloxan	11 40	Tin
	9 3 cc Jamaica al	11 50	new Tin
	8 5 cc Jamaica al —	1220	" Tin

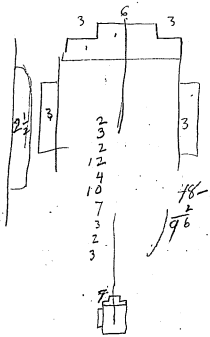
We now ~~start~~ charging again at 12 20
·2 amp

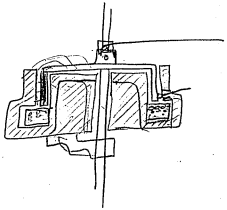
Run for 4 hours about .8
amp hour
put in discharge
All the time the electrode
made large sponges
that would float!
Corrugated grid fine deposit
Amico little fluffy
Phenacolin ditto
Old Immunol
badly fluffed
Aloxuvulin good
dead good type —
other sponges —

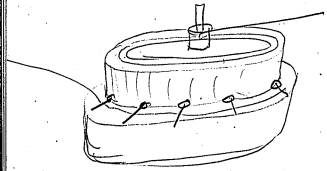


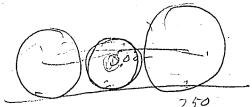
22.

38

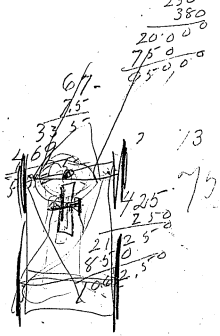


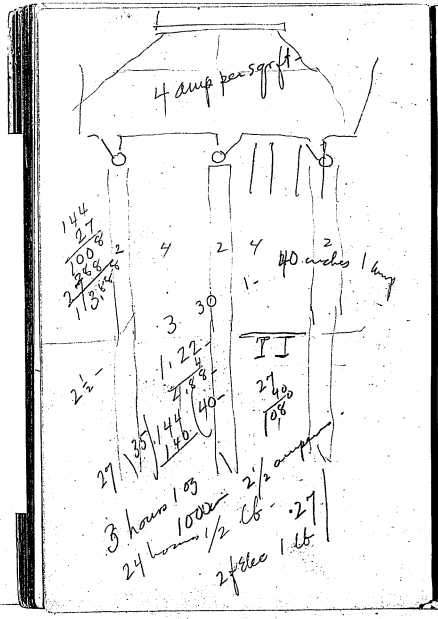


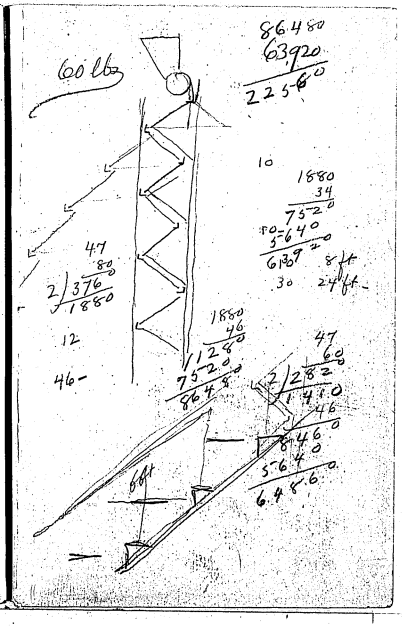




250
380
20.000
75.0
95.0




4 amp per sq ft
144
27
100
288
2
2 4 2 4 2
1.
40 inches long
3 30
1.22
48
27
40
108
2½
27 35 144 40
3 hours 100
24 hours 1/2 lb
2½ amp
.27
2 ft lbs 1 lb


60 lbs
86480
63920
225600
10
1880
34
7520
10
56400
61880
8 ft
30 24 ft
47
80
2 376
1880
12
46
1880
46
1280
7520
8648
47
60
2 282
1410
46
8460
5640
6486
6 ft